



Library **Brainware University** 398, Ramkrishnapur Road, Barasa Knikala Mari

BRAINWARE UNIVERSITY

Term End Examination 2024-2025 Programme – B.Tech.(RA)-2022/B.Tech.(RA)-2023 Course Name - Signal and Systems **Course Code - PCC-ECR303** (Semester III)

Time: 2:30 Hours Full Marks: 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

(Multiple Choice Type Question)

1 x 15=15

- Choose the correct alternative from the following:
- (i) Identify mathematical representation of the unit impulse function.

a) $\delta(t)$

b) u(t)

c) sgn(t)

- d) r(t)
- (ii) State the relationship between the unit impulse function $\delta(t)$ and the unit step function
 - a) $\delta(t) = u(t)$

b) $\delta(t) = u(t) - u(t-1)$

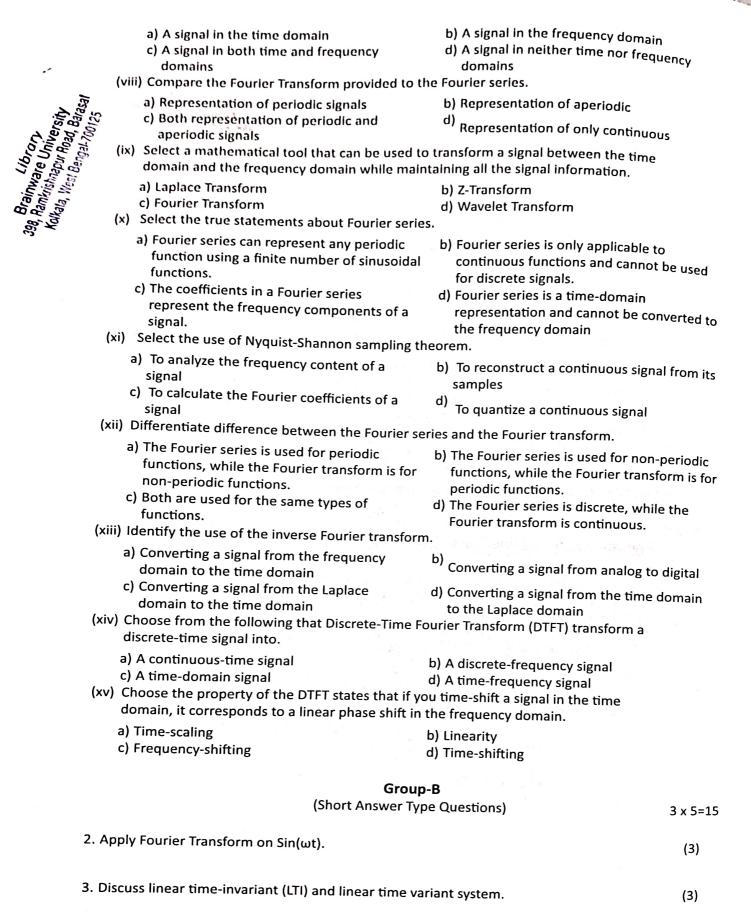
c) $\delta(t) = u(t+1) - u(t)$

- d) $\delta(t) = u(t) + u(t-1)$
- (iii) Given two discrete-time signals x[n] and h[n], if x[n] has a length of 4 and h[n] has a length of 3, compute the length of the resulting convolution y[n].
 - a) 1

b) 2

c) 3

- d) 6
- (iv) Choose a characteristic property of a Linear Time-Invariant (LTI) system.
 - a) It can exhibit exponential growth or decay.
- b) It can change its characteristics over time.
- c) It satisfies the superposition principle.
- d) It can only process sinusoidal input signals.
- (v) Choose from the following statements that is true regarding energy signals and power signals.
 - a) Energy signals have finite power, while power signals have finite energy.
- b) Energy signals have finite energy, while power signals have finite power.
- c) Both energy signals and power signals have finite energy and power.
- d) Energy signals have infinite energy, while power signals have finite power.
- (vi) Indicate from the following statements that is true regarding the Fourier transform of a continuous-time signal.
 - a) It yields a continuous frequency spectrum.
- b) It yields a discrete frequency spectrum.
- c) It is not applicable to continuous-time
- d) It depends on the signal's phase.
- (vii) Cite the representation of the Fourier series represent.



(3)

4.

The sampling frequency of a signal is $Fs = 2000$ interval.	samples per second. Determine its Nyo	quist
5. Deduce Linearity property of Laplace Transform.	Library Brainware University Brainware University	(3)
6. Discuss the concept of a system.	Brainware University 398, Ramkrishnapur Road, Barasal Kolkala, West Bengal-700125	(3)
Differentiate between static and dynamic systems	OR ems with examples.	(3)
	Group-C er Type Questions)	5 x 6=30
7. Analyze continuous and discrete time system		(5)
7. Analyze continuous and discrete time system	ns.	(3)
8. Evaluate Z transform of the causal sequenc	e	(5)
$x(n) = \{1, 0, -4, 6, 5, 4 \uparrow$	}	
9. Apply Inverse Fourier on $\delta(\omega)$.		(5)
10. Discuss Ideal sampling technique.11. Discuss rectangular signal.		(5) (5)
12. Evaluate transfer function of the system	$\sin if y(t) = e^{-t} - 2e^{-2t} + e^{-3t}$ and	$x(t) = e^{-0.5\tau}$ (5)
•	OR	
Estimate the response of the system		. (5)
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